

REMOVABLE HANDLES FOR COOKING VESSELS
AND COOKING VESSELS USING SAME

5 BACKGROUND OF THE INVENTION

The present invention relates to cooking vessels, such as pots or pans and the like, and more specifically, to a cooking vessel with one or more removable handles.

10 The construction, packaging and transport of cooking vessels are significantly complicated by permanent handle extensions. Handle extensions promote packaging and shipping inefficiency from not being able to stack vessels efficiently and in the creation of dead space around the protruding handle. In a mature industry, such
15 inefficiencies create significant sources of cost.

These increased manufacturing costs of packaging and shipping are multiplied at the retail level in terms of increased uptake of inventory storage. After sale, these space problems continue with the cooking vessels' ultimate
20 consumers.

When putting away cooking vessels, such as pots and pans for storage, one of the most annoying aspects is not only that the cooking vessel handles take up much of the precious space in kitchen cabinets, but also they interfere
25 with attempts to neatly and stably stack them. The handles

particularly interfere with the ability to nestle a smaller vessel in a larger one. This problem is particularly acute where living space is limited and where storage space is unavailable.

5 In order to solve these problems with cooking vessels, it would seem that one of the most effective ways is to make the handle removable. However, removability alone will not suffice. Safety is an important issue, and the removability of any handle must be surpassed by its safety and security
10 of connection. In other words, a mechanism used for handle attachment must not fail during use.

Removable handles currently marketed are of the type where the handle is not very securely attached to the rim of a cooking vessel. The handle is merely clamped on to the
15 rim of a cooking vessel, which is unsafe, breaks the evenness of the rim line of the cooking vessel, and can inhibit the even more sealable placement of lids. Rim attachment is inherently unstable and places significant holding forces over a narrow area of the rim. Rim
20 attachment requires pressure grasping or some variable mechanical method which is more prone to failure.

What is therefore needed is a system for detachable handles which is safe, secure and easy to use. The system should permit and even enhance stacking and handle storage.
25 The handle, once attached, should be as secure as a

permanently attached.

SUMMARY OF THE INVENTION

The handle system attaches to the side of a cooking
5 vessel and enables the removable handle to be securely fixed
to the cooking vessel and to be easily removed when it is
not required. Several embodiments are disclosed. In one
embodiment, a rectangular handle bracket is mechanically
(screwing, riveting) or physicochemically (welding) attached
10 to the side of a cooking vessel. The bracket is generally
horizontally oriented with respect to the wall of the
cooking vessel so that a vertical opening, which may be
rectangle-shaped, is formed with the sides of the bracket
and the surface of the wall. The interfitting removable
15 handle has a hook on one end, which may be tilted or V-
shaped. The removable handle also includes a separate
press-down plate. This preferably V-shaped hook is inserted
upward into the bracket hole from the bottom side of the
bracket, with the press-down plate being placed against the
20 upper edge of the bracket and top of the V-shaped hook.
These two components of the removable handle stay together
with the use of a circular clip attached to the other end of
the V-shaped hook. The other end of press-down plate slides
in with a sleeve which slides onto the other ends of the
25 V-shaped hook and the press-down plate, the removable handle

is securely attached to the cooking vessel. This combination of a rectangle handle bracket and a removable handle with a hook, and especially with a tilted-V-shaped hook shall be hereafter referred to as "V-Hook Handle."

5 The system described cooperates with the preference presently of selling cooking vessels as a pre-assorted set with pots and pans of different sizes. Cooking vessels will be able to take less storage space and will be able to be stacked neatly and in a stable manner. Further, the system
10 enables smaller packaging used to save very precious point-of-sale space for retailers and ever-increasing freight costs for distributors.

 The objective of the present invention is to provide an easy-to-store cooking vessel by incorporating a removable
15 handle(s) so that the handle(s) can be removed, and multiple cooking vessels may be neatly and stably stacked up or nestled in one other. The bracket anchoring device may be a set of two rivet-like structures. These rivets are mechanically attached to the side of a cooking
20 vessel and horizontally aligned. These rivets are shaped and attached to the wall of the cooking vessel in such a way so that the exterior (outside of the vessel) portion of each of the rivets has a riser portion and a head portion which diameter is larger than that of the riser portion. A
25 removable handle for this type of anchoring device is

tong-shaped with a slotted end piece attached at an angle of approximately 90 degrees on each arm's end. By sliding each end piece of the tong-shaped handle into the space between the wall of the cooking vessel and the underside of rivet head and fitting the riser portion of the rivet into the slot of the end piece, the removable handle is attached to the cooking vessel.

This combination of a set of rivets and a removable tong-shaped handle shall be hereafter referred to as "Tong Handle." Furthermore, the idea of removable Tong Handle may be applied to the lid of a cooking vessel in order to facilitate easier storage and to save storage space.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention, its configuration, construction, and operation will be best further described in the following detailed description, taken in conjunction with the accompanying drawings in which:

Figure 1 shows a section of a cooking vessel with a rectangle bracket attached;

Figure 2 shows a top view of the bracket of Figure 1 and further details on the manner of connection of the rectangle bracket to a partially shown wall of a cooking vessel;

Figure 3 shows a top view of a complete cooking vessel having two brackets;

Figure 4 shows a perspective view of a v-Hook Handle with its two components, V-shaped hook with a circular clip
5 and press-down plate;

Figure 5 shows a side view of the v-hook handle of Figure 4;

Figure 6 shows a perspective view of a v-Hook Handle with a v-hook which is more shallow;

10 Figure 6 shows a perspective view of a v-Hook Handle having its press-down plate removed;

Figure 7 shows a perspective view of a v-Hook Handle with press-down plate having a curved end;

Figure 8 shows a perspective view of a v-Hook Handle
15 with a v-hook which will engage a bracket with both its front wall and press-down plate;

Figure 9 shows a perspective view of a v-Hook Handle engaging a cooking vessel;

Figure 10 is a schematic view showing the engagement of
20 the v-hook handle of Figures 4 and 6 onto a bracket;

Figure 11 is a schematic view showing the engagement of the v-hook handle of Figure 8 onto a bracket;

Figure 12 is a perspective view of a v-Hook Handle secured with a slide on sleeve;

25 Figure 13 is a perspective view of a v-Hook Handle

having a curved press-down plate secured with a slide on sleeve;

Figure 14 is a side view of a v-Hook Handle of Figure 13 and secured with a slide on sleeve;

5 Figure 15 is a perspective view of a v-Hook Handle with curved press down plate which will engage a bracket with both its front wall and secured with a slide on sleeve;

Figure 16 is a perspective view of the v-Hook Handle of Figure 12 engaged onto a bracket of a cooking vessel

10 Figure 17 illustrates a perspective view of a pair of rivets mounted on a cooking vessel wall;

Figure 18 is a top view of a cooking vessel of Figure 17;

15 Figure 19 is an expanded perspective view of a curved head, square shaft rivet;

Figure 20 is an expanded perspective view of a plate shaped head rectangular cross sectionally shaped shaft rivet;

20 Figure 21 is an expanded perspective view of a round head cylindrically shaft rivet;

Figure 22 is an expanded perspective view of a plate shaped head and rectangular cross sectionally shaped shaft rivet;

25 Figure 23 is a partial sectional view of a tong shaped load member having a square slot;

Figure 24 is a perspective view of the tong shaped load member of Figure 23;

Figure 25 is a partial sectional view of a tong shaped load member having a rounded end slot;

5 Figure 26 is a perspective view of the tong shaped load member of Figure 25;

Figure 27 is a view of a pair of tong shaped load members engaging a cooking vessel having rivets by movement of the tong shaped load members toward each other;

10 Figure 28 is a view of a pair of tong shaped load members engaging a cooking vessel having rivets by movement of the tong shaped load members away from each other;

Figure 29 is a perspective view of a pair of vertically oriented brackets which define horizontal, generally rectangular shaped through holes;

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Figure 30 is a top view of cooking vessel seen in Figure 29;

Figure 31 is a partial sectional view of an "E" shaped plate of a tong shaped load member;

20 Figure 32 is a perspective view of the "E" shaped plate of a tong shaped load member of Figure 31;

Figure 33 is a partial sectional view of an "E" shaped plate of a tong shaped load member;

Figure 34 is a perspective view of the "E" shaped plate of a tong shaped load member of Figure 33;

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Figure 35 is a perspective view of the "E" shaped plates of a pair of tong shaped load members oriented toward each other and engaging the vertical brackets seen in Figure 29 on a cooking vessel;

5 Figure 36 is a perspective view of the "E" shaped plates of a pair of tong shaped load members oriented away from each other and engaging the vertical brackets seen in Figure 29 on a cooking vessel;

10 Figure 37 is a perspective view of an overall tong handle having a tie brace;

Figure 38 is a perspective view of an overall tong handle having a linking brace;

Figure 39 is an exploded view of the linking brace of Figure 38;

15 Figure 40 is an assembled view of the overall tong handle of Figure 38 engaging rivets of a cooking vessel;

20 Figure 41 is a partially exploded perspective view of a handle assembly which includes a pair of tong members directed away from each other and captured in an engagement sleeve;

Figure 42 is a partially exploded perspective view of a handle assembly which includes a pair of tong members directed toward each other and captured in an engagement sleeve;

25 Figure 43 is an assembled handle assembly seen in

Figure 42;

Figure 44 is a partially exploded perspective view of a handle assembly which includes a pair of tong members directed away from each other and captured in a grip guide having a guide slot;

Figure 45 is a partially exploded perspective view of a handle assembly which includes a pair of tong members directed toward each other and captured in a grip guide having a guide slot;

Figure 46 is an assembled handle assembly seen in Figure 45;

Figure 47 is a sectional side view of a lid;

Figure 48 is a top view of the lid of Figure 47;

Figure 49 is a view of the ends of opposing handle members having curve ended slots, about a round rivet shaft;

Figure 50 is a view of the ends of opposing handle members having square ended slots, about a square rivet shaft;

Figure 51 is a view of the ends of opposing handle members having curve ended slots, about an oval rivet shaft;

Figure 52 is a view of the ends of opposing handle members having square ended slots, about a rectangular rivet shaft;

Figure 53 is an exploded view of the handle assembly of Figure 49 along with illustration of a tray and grip insert

for securing the handle assembly;

Figure 54 is a side view of the assembled handle assembly shown in Figure 53;

Figure 55 is a partial sectional view of a lid having a
5 single rivet;

Figure 56 is a top view of the lid of Figure 55;

Figure 57 is a perspective view of a oval shaped handle mounted atop the lid of Figures 55 and 56, the handle using overlapping hook members;

10 Figure 58 is a closeup view of the oval shaped handle of Figure 57;

Figure 59 is a closeup view of the oval handle oppositely oriented overlapping hook members seen oppositely engaging a rectangular rivet shaft;

15 Figure 60 is a closeup view of the oval handle oppositely oriented overlapping hook members seen oppositely engaging a square rivet shaft; and

Figure 61 is a closeup view of the oval handle oppositely oriented overlapping hook members seen oppositely
20 engaging an oval rivet shaft.

DETAILED DESCRIPTION OF THE INVENTION

The removable handle mechanism of the present invention consists of two main components, a removable handle and an
25 anchoring device for the removable handle. There are two

types of removable handle disclosed. The first is a handle with a v-shaped hook at one end and the second is a tong-shaped handle. The handle with a v-shaped hook at one end shall be referred to as "v-hook handle" hereafter and the tong-shaped handle shall be referred to as "tong handle". Each type of these removable handles is associated with a different type of handle anchoring device. The following is a brief description of each type of removable handle and its anchoring device.

Throughout all of the structures shown, interfitting of parts may be assisted by a magnetic property of the materials, or in the alternative, they may be interference fit or other manner of making a stable assembly. Some of the potential geometry and magnetic orientation of the materials may be mentioned, but the specific magnet polarity arrangement may vary widely from structure to structure. Further, it is understood that heat can have a deleterious effect on magnetic materials and it will generally be preferable to locate the holding force and magnetic field polar focus to locations as much removed from the heat source as is possible.

Referring to Figure 1, a perspective view of a portion of a cooking vessel 101 shows a side wall 103 and a bracket 105. Bracket 105 is generally expected to be rectangular in order to leave a thinner space in terms of distance between

the side wall 103 and the center of the bracket 105. The bracket 105 may be attached to the side wall 105 through a pair of oppositely oriented footing members 107 which are oriented generally parallel or following the outer surface of the side wall 103. Footing members 107 may be attached to the side wall 105 by welding, bolting, riveting, screwing, or other safe, secure method.

Referring to Figure 2, a top view of the portion of cooking vessel 101 illustrates a somewhat rectangular shaped through hole 109. The component parts of the bracket 105 are seen to be a pair of riser sections 111, each located adjacent the turning corner of the bracket footings 107. The riser sections 111 angle sharply toward each other and a main portion 113 of the bracket 105 is identified.

The width of the through hole 109 is defined by the space between the cooking vessel wall 103 and main portion 113 of the bracket 105. The shape of the through hole 109 will be narrower at the center of the main portion 113 for cooking vessels 101 with more sharply curved walls.

Referring to Figure 3, a view of two sides of a cooking vessel 101 is seen as fitted with a pair of brackets 105.

Referring to Figure 4, a side perspective view of a v-hook handle member 115 is seen, with the name referring to the lateral shape. A front wall 117 is sharply angled with respect to a rear wall 119 to form a "v" hook shape from a

lateral perspective. The angle of the front wall 117 may have an angle with respect to the rear wall 119 to form a friction fit with respect to the structures surrounding the somewhat rectangular shaped through hole 109. A raised side edge 121 and a raised side edge 123 are seen, and a press-down plate 125 is seen between the side edges 121 and 123. A circular clip 127 is seen at the far end of the v-hook handle.

A pair of slots 129 are seen in the front wall 117. The slots 129 are upwardly directed and may be cut or formed. The two slots 129 are shaped in such a way that each slot accepts the corresponding riser section 111 of the bracket 105. The v-hook handle 115 circular clip 127 is attached or formed with the end of the v-hook handle 115 farthest away from the cooking vessel 103. The press-down plate 125 is a separate structure. Either the press-down plate 125 may be made magnetic especially to engage the top of the front wall 117 as well as the structure underlying the press-down plate 125. The circular clip structure 127 may serve to hold down and cover the other end of the press-down plate 125. In the alternative, raised side edges 121 and 123 could be oppositely magnetically polarized to trap the press-down plate 125.

Referring to Figure 5, a side view of the v-hook handle member 115 is shown.

Referring to Figure 6, a further embodiment of a variation on the v-hook handle member 115 is seen as a v-hook handle member 131 having a more shallow "v" shape. The press-down plate 125 is shown in lifted position to expose an underlying horizontal planar member 133 which supports the pair of opposing side edges 121 and 123.

As an alternative magnetic arrangement, the press-down plate 125 can be vertically magnetically polarized, as can the underlying horizontal planar member 133. However, mechanical structure for facilitating connectivity is also possible.

As can be seen the pair of opposing side edges 121 and 123 can act at minimum as a guide for the placement of the press-down plate 125 and can have surface modifications including snap interference surfaces and more. The circular clip 127 is designed in a way so that it allows the press-down plate 125 to slide snugly into its opening defined by raised side edges 121 and 123 and underlying planar member 133.

The v-hook meeting shape of the front wall 117 and rear wall 119 is shaped in a way so that when its front wall 117 is applied to the side wall 103 of the cooking vessel 101, the open end front wall 117 lies nearly flat to perfectly flat against the side wall 103. Of course, different curvature cooking vessels 101 will have different curvature

side walls 103, and there is no particular restriction that a given v-hook handle 115 can be only applied to one corresponding cooking vessel 101.

When the front wall 117 of the v-hook handle member 115 or 131 is inserted upward into the bracket hole 109, the press-down plate 125 is placed on top of the underlying planar member 133. Also, the end of the press down plate 125 is inserted into the opening of the circular clip 127. When the handle of the v-hook handle 115, 131 presses down on the upper edge of the bracket 105, the v-hook handle 115, 131 is securely attached to the wall 103 of the cooking vessel 101.

Referring to Figure 7, a variation on the v-hook handle member 115 is seen as a v-hook handle member 131 where the press-down plate 125 has a curved end 135 which extends downward to meet the upper edge of the front wall 117. Magnetic structure may be expected to be employed in all of the remaining embodiments in a manner which may be similar to or different from that described for Figures 4 - 6.

Referring to Figure 8, a further variation on the v-hook handle members 115 and 131 is seen as a v-hook handle member 141, which has a press-down plate 143 having a curved forward end 145 which is somewhat complementarily shaped with respect to the structure below it. The curved forward end 145 may have a deeper fitting extent, and is shown as

having a pair of downwardly extending side projections 147 which are complementary to a centered upward projection 149. A vertical gap is preferably had between the downwardly extending side projections 147 and the centered upward projection 149 where it is desired to engage the inside and outside of the bracket 105. The other details of the v-hook handle member 141 are the same as for v-hook handle members 115 and 131. If it is desired only to engage the inside of the bracket 105, the width of the front wall 117 could be expected to be narrower to enable the front wall 117 to fit more completely within the rectangular shaped through hole 109, preferably closely fitting against the inside of the footing members 107. The v-hook handle members 115, 131, and 141 may be altered to suit an individual applications.

Referring to Figure 9, a perspective view of the attachment of the v-hook handle members 115 to the cooking vessel 101 by engagement with the bracket 105 is shown. In terms of the action of attachment, with the press-down plate removed, the front wall 117 is positioned adjacent the side wall 103 directly underneath the bracket 105 in a position where the two slots 129 of the front wall 117 are directly underneath riser sections 111.

Referring to Figure 10, this is somewhat schematically illustrated with the side wall 103 eliminated for clarity of illustration. The front wall 117 is shown underneath the

bracket 105, while the press-down plate 125 is shown above,
as having been removed. Upward movement of the front wall
117 through the inside rectangular shaped through hole 109
and outside of the rectangular shaped through hole 109,
5 combined with downward implacement of the press-down plate
125 will form the structure seen in Figure 9.

Referring to Figure 11, a view similar to that seen in
Figure 10 illustrates front wall 117 of v-hook handle member
141. As shown, the curved forward end 145 of the press-down
10 plate 143 is shown with the pair of downwardly extending
side projections 147 which are sized to fit to the outside
of the riser sections 111. The centered upward projection
149 fits within the rectangular shaped through hole 109.
Thus, the v-hook handle member 141 "bites" or engages
15 bracket 105 on its inside and outside.

In terms of providing a structure to hold down the
press down plates 125 and 143 it is noted that the
positioning and choice of materials for the circular clip
127 can assist in holding press down plates 125 and 143
20 down. In addition, the use of magnetic materials can also
aid this effort. The bracket 105, press down plates 125 and
143, underlying planar member 133, or raised side edges 121
and 123 can each have magnetic materials of the proper
polarization to form a secured interfitted relationship.

25 Referring to Figure 12, a different holding and

securing arrangement is shown. A v-hook handle member 151
uses a slide on holder sleeve 153 to secure press-down plate
125 onto the top of an underlying planar member 133
instead of the circular clip 127 which is shown attached to
5 the v-hook 115.

Underlying planar member 133 is the same as was seen
for v-hook handle member 115, but the raised side edges 121
and 123 are removed and the holder sleeve not only holds the
press-down plate 125 into position over the top of the front
10 wall 117, but also gives it the lateral stability and
centeredness over the underlying planar member 133. The
holder sleeve 153 can be elastomeric or metal and may be
stressed to put force pressure onto the stacked press-down
plate 125 and underlying planar member 133.

15 Referring to Figure 13 a v-hook handle member 155 uses
the slide on holder sleeve 153 to secure the press-down
plate 125 having a curved end 145, with respect to the top
of the front wall 117 and the upper surface of the planar
member 133. The view of Figure 13 shows an assembled v-hook
20 handle member 155. Referring to Figure 14, a side view of
the v-hook handle member 155 seen in Figure 13 is shown.

Referring to Figure 15, an exploded view of v-hook
handle member 161 includes the press-down plate 143 with
downward projections 147 opposing a front wall 117 having a
25 centered upward projection 149 is shown.

Referring to Figure 16, a perspective view of the attachment of the v-hook handle member 151 to the cooking vessel 101 by engagement with the bracket 105 is shown. The v-hook handle member 151 is attached to a handle
5 anchoring device bracket 105, which is permanently attached to the exterior wall 103 of the cooking vessel 101. Again, the bracket 105 is a rectangle bracket permanently attached at its footing members 107 which extend outward by means of screwing, bolting, riveting or welding on the wall 103 of
10 the cooking vessel 101.

The vertical rectangular shaped through hole 109 formed with the three sides of the bracket 105 and the wall 103 of the cooking vessel 101 is sized and shaped to snugly accommodate the end wall 117 of the v-hook handle 151 when
15 it is inserted upward into the rectangular shaped through hole 109 from the bottom side of the bracket 105. The slide-on sleeve 153 is preferably box-shaped with an open side. When the press-down plate 125 is placed on top of the underlying planar member 133 and the slide on holder sleeve
20 153 slid over the underlying planar member 133 and press-down plate 125, v-hook handle member 151 will become secured onto the wall 103 of the cooking vessel 101 as shown in Figure 16. The design of the front wall 117 and the press down plate 125 or 135 may be altered to suit any
25 individual application. The slide-on sleeve 153 is shown as

being box-shaped. However, the shape of the slide-on sleeve may be altered to improve its ergonomic and aesthetic qualities.

Referring to Figure 17, a beginning of an explanation
5 of a tong handle system is presented. A cooking vessel 101 side wall 103 has a pair of stand out rivets 201. Rather than include insertion up to the heads 203, the rivets 201 are stood off from the surface of the side wall 103 to expose a length of the shafts 205 of the rivets 201.

10 Referring to Figure 18, a top view of cooking vessel 101 illustrates the positions of the rivets 201 on a cooking vessel 101 having two pairs of such rivets 201. For stacking, the rivets 201 should be located close to the top of cooking vessels 101 with the height of each additional
15 stacked cooking vessel adding a dimension between the rivets 201 and the top of the cooking vessel 101.

Several rivet shapes are possible, with the shape of rivets 201 shown as having spherical heads 203 and a rectangular shaft 205.

20 Referring to Figure 19 an expanded perspective view of rivet 201 and illustrating the curved head 203 and square shaft 205. As shown in Figure 19, the rivet 201 may have one head 203 larger than the other, typically with an internal (inside side wall 103) head (typically smaller)
25 being closely conforming to the side wall 103. The exterior

head 205 seen in Figure 17 is typically large to enable significant torsional and pulling forces to be supported.

Referring to Figure 20, a rivet 211 having a pair of plate shaped heads 213 and a rectangular cross shaped shaft 215 is shown. The use of a rectangular cross sectional shaped shaft 215 can enable more significant torsional load in one direction than another.

Referring to Figure 21, a rivet 221 having a pair of rounded heads 223 and a cylindrical cross sectional shaped shaft 225 is shown. The use of a cylindrical shaft 225 can enable more load spreading and controlled wear due to elimination of edges.

Referring to Figure 22, a rivet 231 having a pair of plate heads 233 and a rectangular cross sectional shape shaft 235 is shown. The use of a rectangular cross sectional shaped shaft 235 can enable a tighter tolerance head 233 engagement and more controlled torsion.

Referring to Figure 23, a tong shaped load member 251 includes an overall "U" shaped plate 253 having a square slot 255. Overall "U" shaped plate 253 is at right angles to a main length 257 which would normally extend from the paper.

Referring to Figure 24, a perspective view of the extent of the tong shaped load member 251 illustrates that the overall "U" shaped plate 253 may be curved and may be

angled with respect to the main length 257.

Similar to Figure 23, and Referring to Figure 25, a tong shaped load member 261 includes an overall "U" shaped plate 263 having a rounded slot 265. Overall "U" shaped plate 263 is at right angles to a main length 267 which would normally extend from the paper.

Referring to Figure 26, a perspective view of the extent of the tong shaped load member 261 illustrates that the overall "U" shaped plate 263 may be curved and may be angled with respect to the main length 267.

Referring to Figure 27, tong shaped load member 251 is shown engaging rivets 201 extending from a side wall 103 of a cooking vessel 101, in order to show the manner of engagement of the tong shaped load member 251 to lift the cooking vessel 101.

Referring to Figure 28, tong shaped load member 261 is shown engaging rivets 221 extending from a side wall 103 of a cooking vessel 101, in order to show the manner of engagement of the tong shaped load member 261 to lift the cooking vessel 101.

In terms of interfit and use, the "U" shaped plate 253 and 263 has a slots 255 and 265 formed in them. The, "U" shaped plate 253 and 263 is preferably slightly curved so that when it is applied to the exterior surface of the wall 103 of the cooking vessel 101, it can lie flat to eliminate

an otherwise gap between the "U" shaped plate 253 and 263 and the surface of the wall 103. The tong shaped load members 251 and 261 are made of metal or heat-resistant hard plastic and made flexible enough or are mechanically
5 joined so that the tong shaped load members 251 and 261 can be squeezed closer, decreasing their relative distance or spread wider, increasing the distance between each other.

As has been shown, the anchoring device for the tong shaped load member 251 and 261 are rivets 201 attached
10 to the wall 103 of a cooking vessel 101, and they are shown horizontally aligned. One of the heads of each rivet 201 rests against the interior surface of the wall 103 of the cooking vessel 101. The exposed shaft 205, 215, 225, or 235 of the rivet 201, 211, 221, or 231 acts as a riser and its
15 cross sectional size is such as to enable tong shaped load members 251 and 261, by their "U" shaped plate 253 and 263, to be firmly fixed against the exterior wall 103 of the cooking vessel 101.

As with all rivets in this description and throughout
20 the specification, the head of each rivet is larger in at least one dimension to allow the rivet to be mechanically engaged. Generally, the height of the exposed shaft beyond the exterior surface of the wall 103 of the cooking vessel 101 is equal to or slightly larger than the thickness of the
25 "U" shaped plate 253 and 263 so that it allows the "U"

shaped plate 253 and 263 slip into the space between the exterior surface of the wall 103 of the cooking vessel 101 and the bottom of the rivet head 203, 213, 223, and 233.

5 Squeezing the arms of the tong shaped load member 251 or tong shaped load member 261 together allows them to be placed between (or outside of and embracing) the two rivets, 201 for example, on the wall 103 of the cooking vessel 101, aligning the slots 255 or 265 the shafts 205, 215, 225, 235.

10 Referring to Figure 29, a beginning of an explanation of an alternative version of a tong handle system is presented. A cooking vessel 101 side wall 103 has a pair of vertically oriented brackets 281 which define horizontal, generally rectangular shaped through holes 283. The pair
15 of vertically oriented brackets 281 each have a pair of footing members 285 and a main portion 287.

Referring to Figure 30, a top view of cooking vessel 101 illustrates the positions of the pair of vertically oriented brackets 281 on a cooking vessel 101 having two
20 pairs of such pair of vertically oriented brackets 281. For stacking, the pair of vertically oriented brackets 281 should be located close to the top of cooking vessels 101 with the height of each additional stacked cooking vessel adding a dimension between the pair of vertically oriented
25 brackets 281 and the top of the cooking vessel 101. Again

slight variation in the shape of the pair of vertically oriented brackets 281 are possible.

Referring to Figure 31, a tong shaped load member 291 includes an overall "E" shaped plate 293 having a pair of narrow, rounded slots 295. Overall "E" shaped plate 293 is at right angles to a main length 297 which would normally extend from the paper.

Referring to Figure 32, a perspective view of the extent of the tong shaped load member 291 illustrates that the overall "E" shaped plate 293 may be curved and may be angled to one side with respect to the main length 297.

Similar to Figures 31 and 32, and Referring to Figures 33 and 34, a tong shaped load member 299 is of opposite orientation than the tong shaped load member 291, but otherwise has the same structures as tong shaped member 291.

Referring to Figure 35, a pair of tong shaped load members 291 and 299 are shown engaging pair of vertically oriented brackets 281 with each of the tong shaped load members 291 and 299 opposing each other with the slots 295 of the tong shaped load members 291 and 299 in an opposing relationship. In the orientation of Figure 35, the middle portions of the plates 293 engage the vertically oriented brackets 281 by moving toward each other.

Referring to Figure 36, the pair of tong shaped load members 291 and 299 are shown engaging pair of vertically

oriented brackets 281 with each of the tong shaped load members 291 and 299 opposing each other with the slots 295 of the tong shaped load members 291 and 299 facing away from each other. In the orientation of Figure 36, the middle portions of the plates 293 engage the vertically oriented brackets 281 by moving away from each other.

In order to facilitate moveable placement of members, followed by fixation of placement of the members heretofore described, some locking into a desired attached state is preferable. A secure sliding lock, fitting, ring lock, or other structure which prevents disengagement can work well with any structure to maintain its locked position.

Referring to Figure 37 a complete tong handle 301 includes a pair of connected tong shaped load members 261. A tie brace 303 is shown as being moved from a rearward resting position 305 to a forward resting position 307. Now especially where the tie brace 303 is non-rigid, the tong handle 310 may be formed to naturally spring wide apart without any tie brace 303. In this case, moving the tie brace 303 to the rearward position 305 would insure that the tong shaped load members 261 untrammel their natural spring force to use spring force to engage rivets 201, 211, 221, or 231. The forward movement of the tie brace 303 to the position 307 will exert inward displacement force enough to enable disengagement of the rivets 201, 211, 221, or 231.

Rearward resting position 305 and forward resting position 307 may typically be indented portions of the overall tong handle 301.

5 The tie brace 303 may be of one piece construction, or may be a once-twisted ring, forming two rigid separated ringlets. Each ringlet of the tie brace 33 encircles one of the arms of the tong shaped load member 251.

By sliding the tie brace 303 along the arms of the tong shaped load member 251, or 261, the relative movement of the engagement ends toward or away from each other is restricted and controlled, to a position of either spreading them further apart or bringing them closer together. The tong shaped load members 251 and 261 can be spring biased toward or away from each other with tie brace 303 working with or against the direction of spring urging. Rearward resting position 305 and forward resting position 307 can be established physically by forming a set of two grooves or other physical structure which promotes stability at either of the two positions 305 and 307. Generally, where the spring bias is set to move the tong shaped load members 261 away from each other, the rearward resting position 305 will enable manipulation of the "U" shaped plates 263 into a locked position, while forward resting position 307 will enabled the "U" shaped plates 263 into an un-locked position.

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Referring to Figure 38 a complete tong handle 311 includes a pair of connected tong shaped load members 261. A linking brace 313 is shown as being moved from a rearward resting position 305 to a forward resting position 307 to insure that the tong shaped load members 261 remain urged away from each other after they engage the rivets 201, 211, 221, or 231. Rearward resting position 305 and forward resting position 307 may typically be indented portions of the overall tong handle 301.

Linking brace 313 is shown to be a bracket-type device which is snapped onto the arms of the tong shaped load members 261 and slid along their length, increasing or decreasing the distance between the two tong shaped load member 251 or 261. Again, grooves or other physical structures may be present to give effect to the rearward resting position 305 and forward resting position 307. Again, the load members 261 may be spring biased to either position, but preferably toward a locking position.

Referring to Figure 39, an exploded view of the linking brace 313 having a top plate 315 which is shown to be of an inverted "W" shape, and a bottom plate 317. The forward resting position 261 is seen as an indentation section 315.

Referring to Figure 40, an overall view similar to that of Figure 27 illustrates a complete view of the cooking vessel 101 having a connected tong handle 321 in which the

tong shaped load members 261 are oriented so that the main
lengths 267 are oriented such that the rounded slots 265
face each other and in which the linking brace 313 is
engaged to keep the rounded slots 265 engaged onto the
5 rivets 201.

In Figures 37 and 39, the complete tong handle 301 and
311 were seen as having an elongated letter "U" shape.
However, a support structure may be designed to be shorter
and more square-shaped, and utilize a square relationship so
10 that, for example, two support structures join or are
supported at right angles. The shortness of support
structure will inhibit flexibility and make more difficult
any sliding brace locking structure. However this problem
is addressed by providing a fixation groove in other more
15 specialized structure to hold support structures into an
engagement position.

Referring to Figure 41, a handle assembly 331 includes
a pair of tong members 333 having oppositely directed slots
255 and which are captured in an engagement sleeve 335 and
20 secured by a slidable cover member 337.

Referring to Figure 42, a variation is seen as a handle
assembly 341 includes a pair of tong members 343 having
opposing slots 255 and which are again captured in an
engagement sleeve 335 and secured by the same slidable cover
25 member 337. Figure 43 illustrates the handle assembly 341

in completely assembled position. In Figures 41 and 42, the tong members 333 and 343 may be connected to each other or integrally formed.

Referring to Figure 45, a further variation is seen as
5 a handle assembly 351 which includes a pair of tong members 333 having opposing slots 255 and which are captured in a handle grip guide 353 having a guide slot 355. Once the grip guide 353 is fitted under the tong members 333 such that the tong members 333 fit closely within the guide slot
10 355. To secure the engagement, a curved grip mold cover 357 snaps around the handle grip guide 353 tong members 333 assembly.

Referring to Figure 45 a further variation is seen as a handle assembly 351 which includes a pair of tong members
15 333 having opposing slots 255 and which are again captured in handle grip guide 353 having a guide slot 355 and covered with curved grip mold cover 357.

Referring to Figure 46, handle assembly 361 is shown in assembled condition. Again in Figures 44 and 45, the tong
20 members 333 and 343 may be connected to each other or integrally formed.

Stacking and storage can also be facilitated by the use of removable lid handles. A pot lid 371 has a pair of stand off rivets 201. Figure 48 is a top view of the lid 371 of
25 Figure 47.

Referring to Figure 49, a pair of opposing handle members 375 having rounded termination slots 377 lie on opposite sides of a cylindrical shaft 255. When the opposing handle members 375 pass one over the other in a manner which brings the slots 377 against the shaft 255, a stable configuration will be achieved so long as the handle members 375 are held together to continue to effectively capture the standoff rivets 221. Handle members 375 are preferably identical and can achieve the orientation of Figure 49 by rotating one of them 180° to a position where the slots 377 oppose each other.

Referring to Figure 50, further variations are seen. Figure 50 illustrates, a pair of opposing handle members 381 having square termination slots 383 which lie on opposite sides of a square shaft 205. When the opposing handle members 381 pass one over the other in a manner which brings the slots 383 against the shaft 205, a stable configuration will be achieved so long as the handle members 381 are held together to continue to effectively capture the standoff rivets 201.

Referring to Figure 51, a pair of opposing handle members 385 having oval termination slots 387 lie atop each other on opposite sides of an oval shaft 235. The opposing handle members 385 lie one over the other in a manner which brings the slots 387 against the shaft 235, a stable

configuration will continue so long as the handle members
385 are held together to continue to effectively capture the
standoff rivets 231. Again, handle members 385 are
preferably identical and can achieve the orientation of
5 Figure 51 by a 180° rotation.

Referring to Figure 52, a pair of opposing handle
members 391 having square termination slots 393 which lie on
opposite sides of a rectangular shaft 215. As before, the
opposing handle members 391 overlies each other in a manner
10 which brings the slots 393 against the shaft 215.

Referring to Figure 53, an exploded view of the handle
assembly of Figure 49 illustrates one way to hold the
opposing handle members 375 together, by a tray 397 having a
"C" cross sectional shape and an overlying plate or grip
15 insert 399. The relationship between tray 397 and grip
insert 399 can be plastic snap, or metal magnetic, including
a plastic coated magnetic material.

Referring to Figure 54, an assembled handle assembly
401 is secured by a grip assembly 403 atop a lid 371.

20 Referring to Figure 55 a variation for lids 371 having
a single, centrally located rivet 221 with a cylindrical
shaft, for example, is shown. Figure 56 is a top view of
the complete lid 371 seen in Figure 55. Referring to Figure
57 an oval handle 409 with a pair of oppositely oriented
25 overlapping hook members 411 are seen. The handle 409 has a

grip portion 413.

Referring to Figure 58, a closeup of the oval handle 409 is seen. The pair of oppositely oriented overlapping hook members 411 are seen oppositely engaging the shaft 225 of the rivet 221.

Referring to Figure 59 a variation illustrating a pair of rectangular overlapping hook members 415 are seen engaging the rectangular cross shaped shaft 215 of a rivet 211 is seen. Figure 60 illustrates a pair of square overlapping hook members 421 engaging the square cross shaped shaft 205 of rivet 201. Figure 61 illustrates a pair of oval overlapping hook members 425 engaging the cross sectionally oval shaped shaft 235 of rivet 231.

While the present invention has been described in terms of devices and systems used to make handles removable for better shipping and storage, and in particular stackable storage of cooking structures, one of ordinary skill in the art can see that the device of the invention can be applied to many appliances and process tools. The present invention may be applied in any situation where handles and holding structures are desired to be removable.

Although the invention has been derived with reference to particular illustrative embodiments thereof, many changes and modifications of the invention may become apparent to those skilled in the art without departing from the spirit

and scope of the invention. Therefore, included within the patent warranted hereon are all such changes and modifications as may reasonably and properly be included within the scope of this contribution to the art.